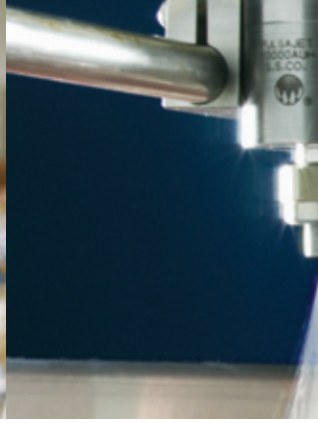
# SUSTAINABILITY SIMPLIFIED

PROVEN WAYS TO MAXIMIZE PRODUCTIVITY, INCREASE SAVINGS AND REDUCE WASTE

Spraying Systems Co.®
Experts in Spray Technology



# WHAT GOALS MATTER MOST TO YOUR OPERATIONS?

In many industries, the short list of plant priorities includes productivity, efficiency, savings, product quality and safety.

That's not surprising, but this may be: Increasing your plant's sustainable practices can actually help you achieve every one of those priorities. In fact, some simple changes can yield significant results for your operations and pay for themselves in a matter of months, if not weeks.

This handbook explores the role spray technology has in saving water, chemicals, coatings, energy, money and time. You'll learn how to simplify sustainability, increase productivity, ensure product quality and improve worker safety on every shift.

## PUTTING SUSTAINABILITY INTO PRACTICE

This handbook was developed to help identify the positive outcomes of optimizing sustainability. However, to fully operationalize the advantages of sustainability, it is important to assess key applications, identify projected savings/ROI and make the necessary changes. For this reason, Spraying Systems Co. developed a Sustainability Assessment Program. Through on-site assessments, we uncover ways to reduce waste, conserve resources and improve worker safety in cooling, coating, cleaning, drying and other operations. The assessment is followed by a detailed report documenting projected efficiencies, cost savings and implementation steps.

For more information on how the Sustainability Assessment Program works, see page 22 of this handbook or visit **spray.com/sustainability-assessment.**

# TABLE OF CONTENTS

## 60-SECOND QUICK QUIZ

Can spray technology advance your sustainability initiatives? This quiz will help you find the answer quickly.

### QUESTION 1: HOW MANY NOZZLES ARE IN YOUR PLANT?

**Check the industry that best describes your plant type:**

- ☐ Automotive
- ☐ Chemical/Petrochemical
- ☐ Food Processing
- ☐ Power
- ☐ Pulp, Paper and Tissue
- ☐ Steel

**Now, find the average number of nozzles for your type of plant listed at the right.**

**Automotive plants: 350 nozzles**

**Chemical/Petrochemical plants: 500 nozzles**

**Food processing plants: 400 nozzles**

**Power plants: 300 nozzles**

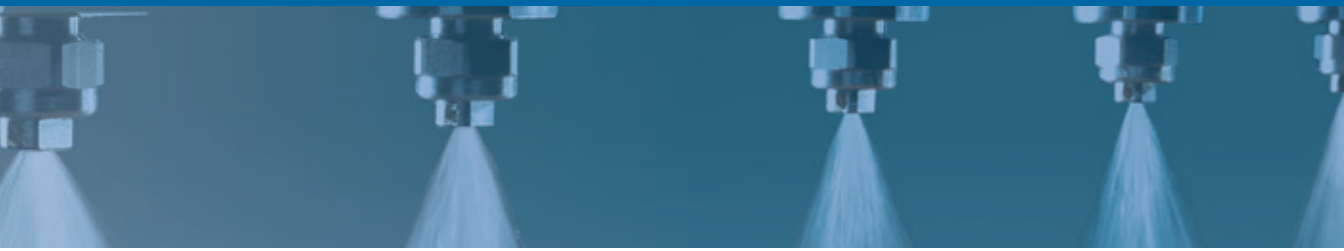
**Pulp, Paper and Tissue plants: 200 nozzles**

**Steel plants: 300 nozzles** in a single roll stand

**KEY TAKEAWAY**

If you have more than 50 nozzles operating below peak efficiency or are using incorrectly sized nozzles for the task at hand, you could be wasting a surprising amount of water, chemicals, energy and money. To illustrate the point, consider the volume that each nozzle sprays. For example, one new full cone spray nozzle sprays 336,000 gallons (1,271,898 liters) every year.* In addition, many nozzle performance issues are not visible and can be difficult to detect.

*Flow rate dependent on nozzle type, size and operating conditions.



## **QUESTION 2:** HOW MANY OF THE FOLLOWING STATEMENTS ARE TRUE IN YOUR FACILITY?

Plant personnel may be hesitant to embrace sustainability initiatives because they believe the costs will exceed the benefits. Others believe they are operating as efficiently as possible and there is little room for improvement. However, in our experience, that's not the case. Our Sustainability Assessment Program includes ROI calculations that show quick payback and consistently uncovers inefficiencies that are often overlooked.

Start by answering the following questions to get a better understanding of how you may benefit from creating or expanding sustainability initiatives.

**1.** Products are rejected due to quality problems with coatings and finishes.
☐ TRUE ☐ FALSE

**2.** Production is disrupted due to unscheduled maintenance time.
☐ TRUE ☐ FALSE

**3.** Cleaning and sanitation operations use significant amounts of water, expensive chemicals and energy.
☐ TRUE ☐ FALSE

**4.** Product quality is affected by changes in line speed or other process variations.
☐ TRUE ☐ FALSE

**5.** Equipment is being cleaned manually.
☐ TRUE ☐ FALSE

**6.** Workers are manually applying chemicals, coatings or ingredients to products.
☐ TRUE ☐ FALSE

**7.** Open hoses are used in cleaning operations and/or open pipes are used in drying and blow-off operations.
☐ TRUE ☐ FALSE

**8.** Health hazards, such as inhaling chemicals or slippery work areas due to misting, are a concern.
☐ TRUE ☐ FALSE

**9.** Spray equipment is monitored consistently to validate proper flow rate and spray coverage.
☐ TRUE ☐ FALSE

**10.** Penalties and fines are possible as a result of not meeting environmental regulations.
☐ TRUE ☐ FALSE

**KEY TAKEAWAY**
If even one of these statements is true for your operations, refining or increasing the scope of sustainability initiatives in your plant can help reduce waste and scrap and improve safety.

# HERE ARE SIX UNEXPECTED OUTCOMES OF MAKING YOUR OPERATIONS MORE SUSTAINABLE

Operating more sustainably will help you save water, chemicals and energy. Those are the expected outcomes. However, sustainable enhancements can also help you achieve some other key objectives in your operations.

## 1 Reduce unscheduled downtime

**Insight:**
At first, the connection between sustainability and uptime may not be apparent. However, an essential component of an effective sustainability strategy is a regular maintenance program. Like any precision equipment, spray nozzles and systems need to be maintained to operate at peak efficiency. Since nozzles are enclosed in other equipment or out of sight, they are often overlooked when it comes to maintenance.

**Outcomes:**
More uptime, increased production and throughput, reduced maintenance costs

## 2 Save money on every shift

**Insight:**
336,000 gallons. That's how much water could flow through one new full cone spray nozzle every year. Now, let's assume 150 nozzles are in operation. That adds up to 50,400,000 gallons per year.* Spray nozzles, like any precision component, will wear with use and nozzles will gradually begin to spray over capacity. Using worn nozzles — even those slightly worn — can cost the plant thousands of dollars, if not hundreds of thousands, annually. For example, if you're using 150 full cone nozzles that are 10% worn, you'll waste 5,040,000 gallons per year. If the nozzles are 15% worn, you'll waste 7,560,000 gallons per year. Making sure nozzles are spraying at the rated capacity will save water, chemicals and energy on every shift.

*Flow rate dependent on nozzle type, size and operating conditions.

**Outcomes:**
Cost savings, less wasted resources

## 3 Operate more efficiently

**Insight:**
The conservation of resources, reduction of waste/scrap and optimization of the workforce are all benchmarks of an efficient and sustainable operation. Efficiency begins by examining cleaning, coating, cooling, lubricating, drying and other operations that use spray technology or manual labor. Improving operational efficiency is almost always possible and ranges from small changes to total process automation.

**Outcomes:**
Ongoing, measurable efficiency and savings

## 4 Reduce labor costs

**Insight:**
The most important resource any company has is its people, especially with the labor market so tight. A sustainability program can offer ways to make the workforce more productive by automating certain spraying applications. In some applications, a completely automated system may be possible and workers can be deployed to other tasks. Automation also brings consistency and repeatability to most operations and contributes to better product and process quality.

**Outcomes:**
Labor cost savings, reduced waste

## 5 Reduce waste

**Insight:**
Changes in nozzle type, placement and spray direction can make a big difference on the volume of fluid used. By optimizing spray nozzle performance, use of chemicals, coatings and ingredients can likely be reduced. In some operations, adding a spray controller can yield even more dramatic results by monitoring and adjusting nozzle performance based on operating conditions.

**Outcomes:**
Dramatic reductions in waste

## 6 Enhance positive company perception

**Insight:**
Your customers, employees and shareholders are very aware of the actions your company takes. Operating sustainably sends a positive message to every key stakeholder and the community.

**Outcomes:**
Enhance brand reputation, improve customer and employee satisfaction

## "TOO GOOD TO BE TRUE"?

When Kevin, one of our sustainability specialists, presented our findings to a leading snack foods company, the projections were met with skepticism.

"They thought it was too good to be true," Kevin recalled. "Basically, they told us if they reached half of those numbers, it would be amazing." As it turned out, the company actually surpassed the projections.

"We helped them save 500 million gallons (1,892,706 kiloliters) of water per year and US$10 million dollars in water and energy. They definitely believe in the results now."

How much can your plant save? Find out with a Sustainability Assessment. Learn more at **spray.com/sustainability-assessment.**

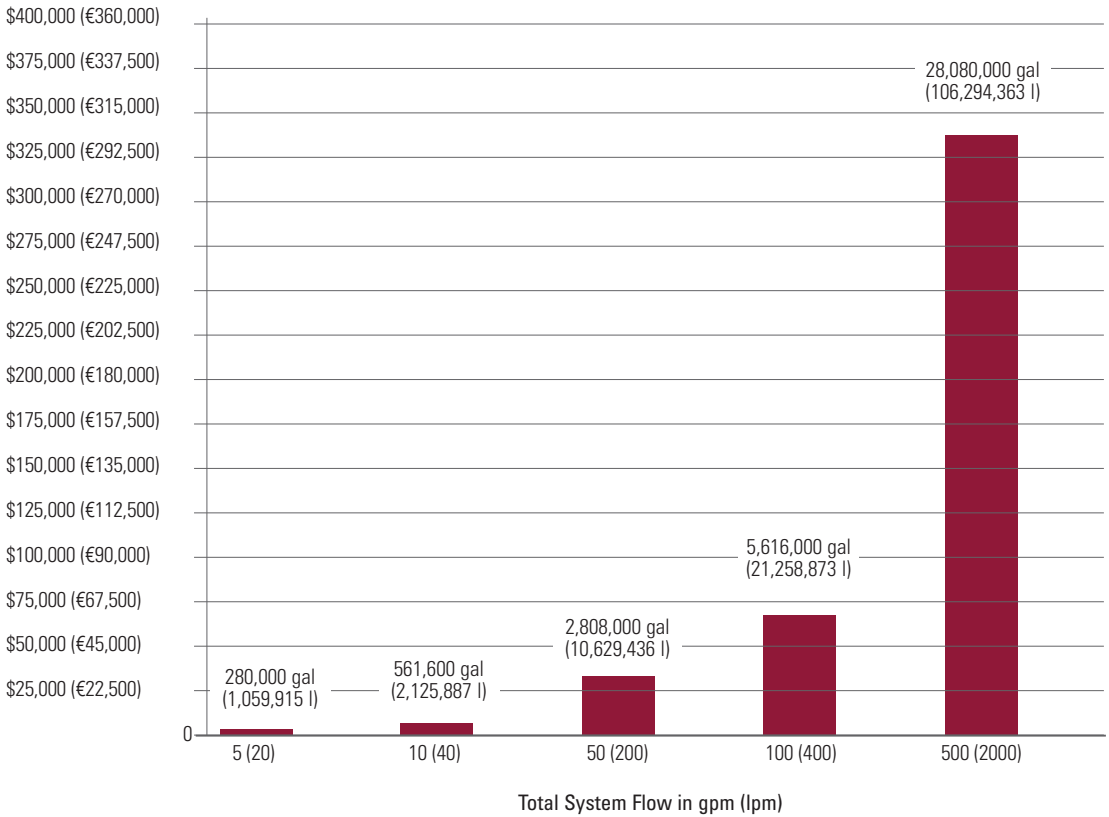
# WORN NOZZLES REDUCE SUSTAINABILITY AND PROFITABILITY

Spray nozzles, like all precision components, will wear over time with use. As a nozzle orifice wears, the flow rate of the nozzle will gradually increase.

The increase in flow rate results in:

- Waste of the solution being sprayed
- Increased pump energy use
- Increased sewer costs
- Increased wastewater treatment costs
- Quality problems caused by inconsistent application of the solution being sprayed

The chart below shows the increase in water and sewer costs from using nozzles that spray just 15% over capacity.




Based on a five-day work week, 24 hours per day, 52 weeks per year. Water cost: US$4.80/1000 gallons (3,785 liters). Sewer cost: US$7.40/1000 gallons (3,785 liters). US$1.00 = €0.90.

# USING INCORRECTLY SIZED SPRAY NOZZLES

You may be surprised to learn how much water flows through a single nozzle. Below we take a quick look at the math and a strategy for reducing water use with lower flow rate nozzles.

## How many gallons (liters) for one nozzle?

The flow rate of a full cone spray nozzle* is:

- **2.8 gallons (10.6 liters) per minute** at 20 psi (1.5 bar)
- **1,344 gallons (5,087 liters) per day** (based on eight hours per day)
- **6,720 gallons (25,438 liters) per week** (based on five days per week)
- **336,000 gallons (1,271,898 liters) per year** (based on 50 weeks per year)

* 3/8" H FullJet®

Now, consider the fact that most manufacturers use hundreds of nozzles in various operations, including cleaning, coating, lubricating, moisturizing, cooling and more.

**Here's an example.**

Let's assume 150 nozzles are in use. How many gallons (liters) does that translate to for a single year?

**336,000 GALLONS PER YEAR**
(1,271,898 LITERS)

X **150 NOZZLES**

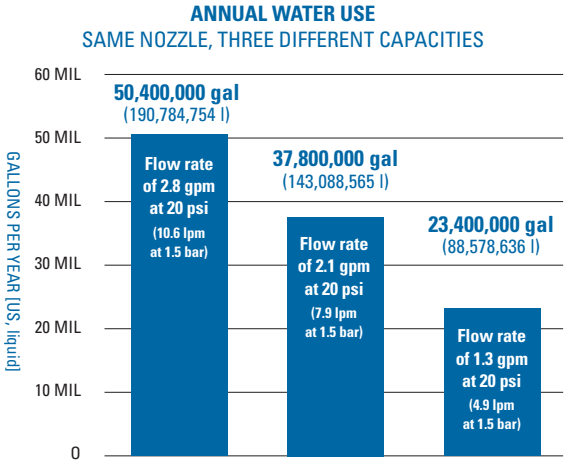
---

= **50,400,000 GALLONS PER YEAR**
(190,784,754 LITERS)

## The lower flow rate difference

What if nozzles with a lower flow rate could be used without compromising effectiveness?

The chart below reveals what could happen.




Based on 150 full cone spray nozzles spraying eight hours per day, five days per week, 50 weeks per year. 3/8" H FullJet nozzle used for the comparison.

- Using a slightly smaller capacity nozzle – a 2.1 gpm (7.9 lpm) full cone nozzle spraying at 20 psi (1.5 bar) – **would reduce water use by 12,600,000 gallons (47,696,188 liters) per year**
- Using an even smaller capacity nozzle – 1.3 gpm (4.9 lpm) at 20 psi (1.5 bar) – **would reduce water use to 23,400,000 gallons (88,578,636 liters) per year, a decrease of 27,000,000 gallons (102,206,118 liters)**

# SEVEN CAUSES OF POOR SPRAY NOZZLE PERFORMANCE

One of the leading causes of poor spray nozzle performance is using worn nozzles. Wear affects the integrity of the spray pattern and increases flow rate. This results in quality issues and wasted fluid. There are other causes of poor nozzle performance in addition to wear. Here are the most common.

## 1. EROSION/WEAR


## 2. CORROSION

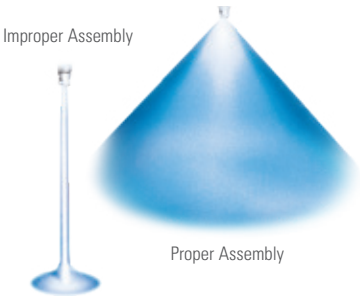

## 3. HIGH TEMPERATURE


## 4. CAKING/BEARDING


## 5. ACCIDENTAL DAMAGE


## 6. CLOGGING


## 7. IMPROPER ASSEMBLY




**Not certain about your nozzles?**
Spraying Systems Co. can help you identify and remedy common nozzle issues so your plant can operate more sustainably and profitably.

## SUSTAINABILITY STRATEGIES

The most common sustainability goals are listed below. You'll find ways to achieve those goals using spray technology on the pages that follow.

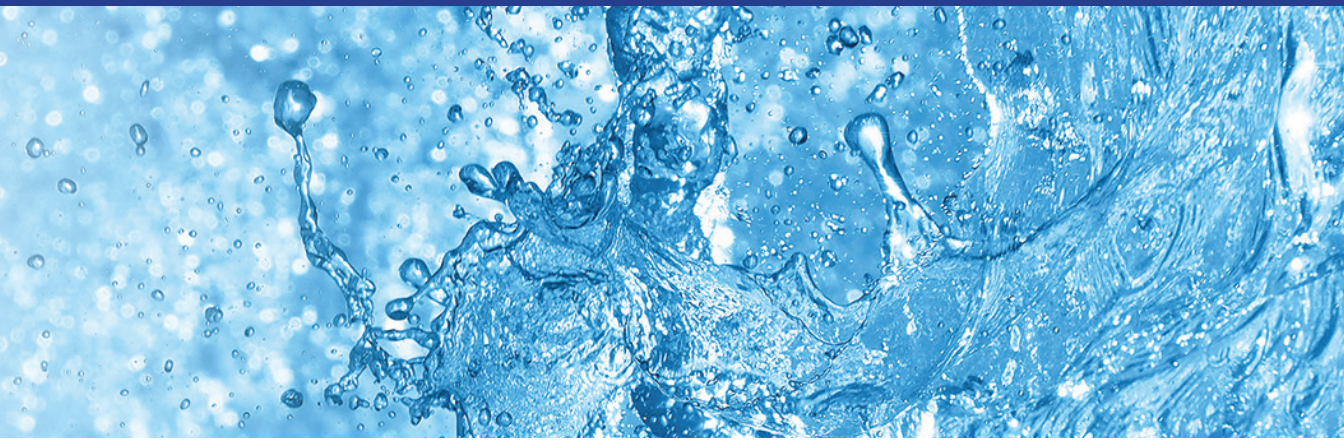
REDUCE
WATER USE

REDUCE
ENERGY USE

REDUCE
CHEMICAL USE

INCREASE WORKER &
FOOD SAFETY

REDUCE
WASTE & SCRAP



## **GOAL:** REDUCE WATER USE

**DID YOU KNOW?**

There's a perception that more flow is better. People tend to size up nozzles to be safe without realizing how much water may be wasted. Significant savings can come from small changes like selecting the right size nozzle for each application. That simple step can directly impact the amount of water you use for processing, manufacturing and sanitation throughout your plant.

**POTENTIAL STRATEGIES**

- Properly size spray nozzles and manifolds
- Use the most efficient nozzle for the operation and make sure it is positioned correctly
- Use high impact nozzles to increase cleaning effectiveness and reduce cleaning time

**REAL-WORLD RESULTS**

Spraying Systems Co. helped a snack food producer reduce water consumption by more than 80% simply by switching to lower flow rate nozzles. This saved US$3 million and more than 500 million gallons (1,892,706 kiloliters) annually.

*For more results, see our sustainability case studies starting on page 18.*

## GOAL: REDUCE ENERGY USE

**DID YOU KNOW?**

Using less water can have a big impact on energy use. The energy required to operate pumps, heat water and treat wastewater decreases proportionally as water use is reduced. Another often overlooked way to reduce energy is to evaluate operations that use compressed air. Alternatives exist and can provide quick payback.

**POTENTIAL STRATEGIES**

- Use properly sized nozzles to minimize pump size
- Use nozzles that eliminate the need to heat the solution being sprayed
- Use hydraulic atomizing nozzles instead of air atomizing nozzles for cooling and humidification
- Replace open pipes with air nozzles
- Replace compressed air nozzles with blower-powered air knives
- Use other fluids for atomization instead of compressed air such as steam or hydrogen
- When air atomizing nozzles are required:
  - Use high-efficiency air atomizing nozzles
  - Use automatic air atomizing nozzles to provide positive air and liquid shut-off
  - Use air and liquid regulators to optimize fluid use

**REAL-WORLD RESULTS**

Spraying Systems Co. helped a can manufacturer reduce energy use by nearly 5,500,000 kWh, a savings of US$500,000 annually.

## GOAL: REDUCE CHEMICAL AND INGREDIENT USE

### DID YOU KNOW?

Over-application and misting are the primary causes of coating waste. Many manufacturers can reduce the use of costly coating by as much as 70% with advanced spray technology. It delivers exceptional precision that saves chemicals and money.

### POTENTIAL STRATEGIES

- Implement Precision Spray Control (PSC) to eliminate over application
- Heat applicable solutions to make them sprayable
- Use timing/sensor control to spray only when needed

### REAL-WORLD RESULTS

Spraying Systems Co. helped a fiber producer eliminate overspray. They saved US$1.4 million annually by dramatically decreasing the use of surfactant.

## GOAL: IMPROVE WORKER AND FOOD SAFETY

### DID YOU KNOW?

Optimized spray technology can help reduce or eliminate risks to worker safety. Proper application of fluids can eliminate slip hazards and improve air quality. Automating application of fluids can make it unnecessary for workers to interact with dangerous equipment and chemicals. Automation also ensures consistent application of fluids and reduces the risk of product contamination and recalls.

### POTENTIAL STRATEGIES

- Prevent excess fluid from accumulating/ pooling on equipment and floors using Precision Spray Control (PSC) technology
- Reduce misting by using nozzles that minimize or eliminate compressed air consumption
- Replace air atomizing nozzles with hydraulic atomizing nozzles
- Automate cleaning operations that require workers to enter tanks or vessels or climb equipment
- Use moisturizing nozzles to prevent and suppress dust
- Protect against pathogens through consistent and uniform application of sanitizers, antimicrobials and mold inhibitors on equipment and food products with PSC

### REAL-WORLD RESULTS

Spraying Systems Co. helped a commercial bakery overcome worker safety issues caused by overspray and misting. Our solution decreased oil use by 50% for a savings of US$1.3 million per year and worker safety was greatly improved. OSHA tests validated a 90% reduction in airborne pollutants and slippery floors were eliminated. Reject rates also decreased substantially.

## GOAL: DECREASE WASTE AND SCRAP

**DID YOU KNOW?**

A surprising number of quality problems can be traced back to cleaning, coating, cooling and lubricating operations. However, it may not be obvious which part of the process created the issue. Spray technology can be a contributing factor. For example, rust problems can stem from improper application of corrosion inhibitors. Equipment damage can be caused by ineffective gas cooling. Reduction in product shelf life can occur due to variations in antimicrobial interventions. Using advanced spray technology can help ensure proper application to prevent process waste and quality issues.

**POTENTIAL STRATEGIES**

- Eliminate uneven and inconsistent application with Precision Spray Control (PSC)
- Automate processes that use manual labor for cleaning or coating to eliminate variations in water/chemical consumption and application weights and rates
- Ensure nozzles are operating at acceptable pressures and flows. If not, changes in drop size, spray angle and capacity may occur and have a negative impact on product quality

**REAL-WORLD RESULTS**

Spraying Systems Co. helped a metal processor apply the proper volume of oil. By maintaining a precision spray, the processor eliminated rework of 960,000 pounds of strip each year.

## "IT'S ALL ABOUT THROUGHPUT."

Keeping production moving is priority one at any plant.

"At the plant, it's all about throughput. So when we first bring up the topic of sustainability, there can be a little hesitation," one of our sustainability specialists explained. "But our sustainability steps can actually help the plant become more productive and improve product quality. And the savings can be remarkable."

Want to improve productivity and sustainability? It starts with a Sustainability Assessment. Learn more at **spray.com/sustainability-assessment.**

# SUSTAINABILITY SUCCESS STORIES FROM MANY INDUSTRIES

Sustainability initiatives can have positive outcomes in any industry. Here are four case studies that demonstrate how other companies have saved water, chemicals, energy and increased worker safety.

## CHANGE IN CLEANING EQUIPMENT SAVES 1.32 MILLION GALLONS (4,996,744 LITERS) OF WATER AND A US$1 MILLION BOILER INVESTMENT

**Problem**

A large manufacturer was looking for ways to reduce water use – especially heated water. Automated cleaning equipment was already being used and the manufacturer was skeptical that different equipment could make a dramatic difference.

**Solution**

New automated tank cleaners were installed in 14 large mixing tanks.

**Result**

- Reduced water use by 1,320,000 gallons (4,996,744 liters)
- Decreased natural gas consumption by 21%
- Extended the life of the manufacturer's system and eliminated the need to make a US$1 million investment in new equipment
- Reduced maintenance downtime and eliminated approximately US$20,000 per year in equipment repairs

Read the full case study

https://www.spray.com/-/media/dam/industrial/usa/sales-material/case-study/cs259_manufacturer_saves_water_with_automated_tank_cleaning.pdf

## MANUFACTURER SAVES MORE THAN US$140,000 ANNUALLY

### Problem

A manufacturer needed to improve the application of binder fluid on fiberglass prior to it entering a curing oven. The air atomizing nozzles in use didn't apply the fluid uniformly and frequently applied more than was necessary.

In addition, the air atomizing nozzles produced mist that required extra maintenance downtime for equipment cleanup. The high energy costs associated with compressed air was also a concern to the manufacturer.

### Solution

A new automated spray system was installed to provide precise, uniform application of the fluid across the entire width of the fiberglass. The system makes automatic adjustments to flow rate when line speed changes.

### Result

- Resolved quality problems
- Reduced labor costs by US$118,000 annually
- Saved US$15,000 annually by eliminating the use of compressed air
- Totaled more than US$140,000 in annual savings
- Realized a three-month payback

Read the full case study

https://www.spray.com/-/media/dam/industrial/usa/sales-material/case-study/cs286_fiberglass_producers_solves_quality_issue_with_automated_spray_system.pdf

## COAL-FIRED POWER PLANT REDUCES WATER USE BY 50% AND IMPROVES WORKER SAFETY WITH NEW WASHDOWN NOZZLES

### Problem

Removing coal dust on transfer conveyors and tunnels was challenging for one coal-fired power plant in the southeastern US. Spray nozzles were being used for washdown but didn't provide adequate impact and coverage for complete dust removal despite using high volumes of water.

Every night, after the washdown process ended, workers with hoses would manually clean hard-to-reach and high dust accumulation areas.

In addition to incomplete cleaning, the current washdown process created a safety hazard. The nozzles flooded the conveyors and large volumes of water would cascade down to the areas below creating a slip/fall hazard for workers.

### Solution

Existing washdown nozzles have been replaced with TankJet® nozzles, a combination of fluid-driven rotating nozzles and fixed nozzles.
TankJet 6353 and TankJet 80 nozzles are strategically placed to ensure efficient, complete coverage of conveyors and tunnel walls.
Since the installation of the new nozzles, the flooding and worker safety issues have been eliminated as is the need for a second cleaning by workers.

### Result

- Water use reduced by 50%
- Labor savings of US$150,000 annually
- Reduced wastewater treatment costs
- Reduced energy use resulting from use of smaller pumps
- Elimination of slip/fall hazards

Read the full case study

https://www.spray.com/-/media/dam/industrial/usa/sales-material/case-study/cs297_coal-fired_power_plant_reduces_water_use_by_50.pdf

## AUTOMOTIVE COMPANY REDUCES DAILY OIL USAGE BY 70%

### Problem

An automotive company needed to lubricate metal blanks prior to stamping. It used air atomizing spray nozzles to apply lubricating oil. The oil application was inconsistent and the use of compressed air created overspray.

### Solution

A new automated spray system was installed that provided automatic adjustment of flow rate based on line speed.

### Result

- Reduced daily usage of oil by 70%
- Decreased the oil mist and improved worker safety
- Reduced waste oil being hauled away
- Realized a one-year payback

Read the full case study

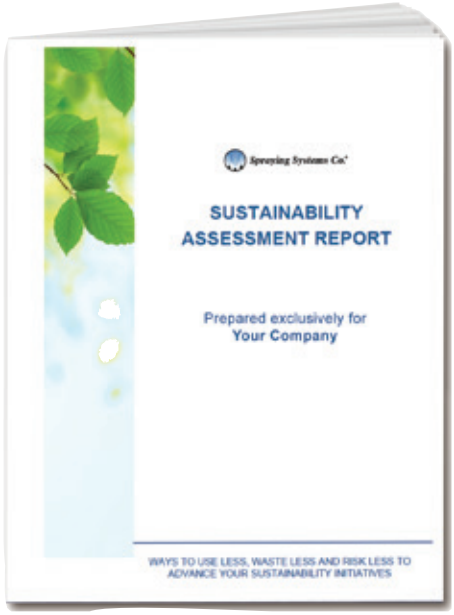
https://www.spray.com/-/media/dam/industrial/usa/sales-material/case-study/cs211_auto_co_reduces_daily_oil_usage.pdf

## GET STARTED WITH OUR SUSTAINABILITY ASSESSMENT PROGRAM

**Interested in results like these?**

| | |
|---|---|
| Number of gallons (liters) saved annually: | 83,170,981 (314,836,412) |
| Water savings: | US$211,902 |
| Average water savings: | 46% |
| Sewer savings: | US$465,592 |
| Energy savings: | US$666,955 |
| ROI: | 21 weeks |

GET EVERY DROP




These are average outcomes from recently completed assessments. Why not find out how you can benefit? Here's an overview of the process.

The assessment happens on-site, with no disruptions to production.

During the assessment, our team of spray technology experts will evaluate essential spraying applications such as cooling, coating, cleaning, drying, mixing and others.

**Our experts will identify actionable ways to:**

- Reduce water, chemical and energy use
- Reduce scrap and waste
- Improve worker safety

A few weeks after the assessment, Spraying Systems Co. will share how you can improve efficiency and how much you can save. You will receive a customized report with the facts, figures and projected outcomes clearly documented. Above all, it's an action plan for achieving your goals.

## BRING ALL OF THE BENEFITS TO YOUR PLANT

Learn how to get started today at **spray.com/sustainability-assessment**

# HOW THE SUSTAINABILITY ASSESSMENT PROGRAM WORKS

## 1 INITIATION

**GOALS:** Get acquainted and set expectations

**WHAT HAPPENS:**

- Express your interest in the program
- We'll let you know the basic types of information needed and schedule a pre-assessment

## 2 PRE-ASSESSMENT

**GOALS:** Establish an action plan

**WHAT HAPPENS:**

- During a video call, we'll review your priorities and develop the action plan
- You complete some worksheets to help ensure the most productive assessment

## 3 ON-SITE ASSESSMENT

**GOALS:** Evaluate plant operations focusing on the applications agreed upon during the pre-assessment

**WHAT HAPPENS:**

- Our team visits the plant of your choice on a date and time that works best for you
- The spray technology experts evaluate cooling, coating, cleaning, drying, mixing or other operations based upon the items you prioritized during pre-assessment planning

## 4 POST-ASSESSMENT

**GOALS:** Report findings and actionable recommendations

**WHAT HAPPENS:**

- Spraying Systems Co. will analyze all the data and calculate potential savings
- We'll provide recommendations to achieve those savings and project the ROI on any equipment needed
- All findings will be documented in a customized report with clear, actionable steps

## 5 FOLLOW UP

**GOALS:** Determine next steps

**WHAT HAPPENS:**

- A few weeks after the report is presented, we will follow up to discuss implementation

## ABOUT SPRAYING SYSTEMS CO.

Spraying Systems Co. is the global leader in spray technology. For us, sustainability is not a recent focus. In fact, we've been committed to helping businesses become more sustainable since 1937.

Every day, our local spray technology experts help customers optimize operations and create more sustainable manufacturing practices.

Sustainability is also essential in our own manufacturing:

- The brass we use contains 70% recycled content
- The steel we use contains 65% recycled content
- Approximately 75% of our R&D processes reuse water


**To get started with the Sustainability Assessment, contact Spraying Systems Co. or visit spray.com/sustainability-assessment**

*Spraying Systems Co.*®
Experts in Spray Technology

North Avenue and Schmale Road, P.O. Box 7900, Wheaton, IL 60187-7901 USA

Tel: 1.800.95.SPRAY Intl. Tel: 1.630.665.5000
Fax: 1.888.95.SPRAY Intl. Fax: 1.630.260.0842

www.spray.com

ISO 9001:2015 14001:2015 CERTIFIED